

The INSTITUTE *Lubricator*



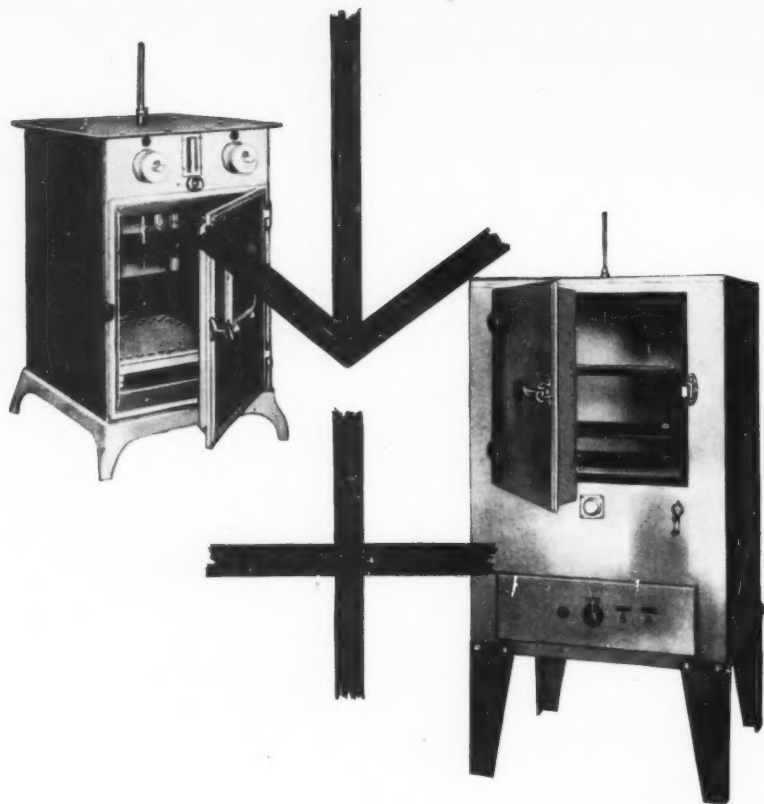
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Official Publication of **NATIONAL LUBRICATING GREASE INSTITUTE**



The direction of plus - A summary of achievement

Precision engineering research is responsible for uncompromising improvement . . . that every laboratory may have the benefit of even the most recent development.

A glance at the two illustrations above will readily reveal the caliber of engineering advancement responsible for the leadership of Precision-Freas constant temperature equip-

ment. The streamlined mechanical convection oven on the right is a great improvement over its gravity convection predecessor.

As no improvement is ever accepted as final, as no design is ever taken as the last word, persistent engineering advancement and uncompromising improvement is the rule as we endlessly progress in the direction of plus.

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WHEN LUBRICANTS NEED A PLUS

On heavy construction jobs, when machinery is driven at full capacity hour after hour, day in and day out; operated over difficult terrain, and under adverse weather conditions—that's when lubricants must have ability plus, if they are to keep moving parts working efficiently and economically.

And that's where lubricants made from Metasap Stearate Bases pay off! Temperature-resistant, water-repellent, stable, they provide advantages that assure better performance under exacting field conditions. Since they do not bleed, cake, freeze, evaporate or dissolve, they do a thorough lubricating job all the time.

For a host of applications throughout the vast construction field, the clear, moisture-free lubricating greases based on Metasap Stearates are unsurpassed. It will profit you to investigate.

Metasap Stearate Bases include: Aluminum Stearate GM for heavy greases; Metasap 537 for firm greases, with no cracking or bleeding; Metavis 540 for low viscosity greases; Metavis 543 for stringiness and body; Metasap 590 for extreme bodying action. Write today for technical details and your complimentary copy of our informative booklet: "Metallic Soaps for Research and Industry".

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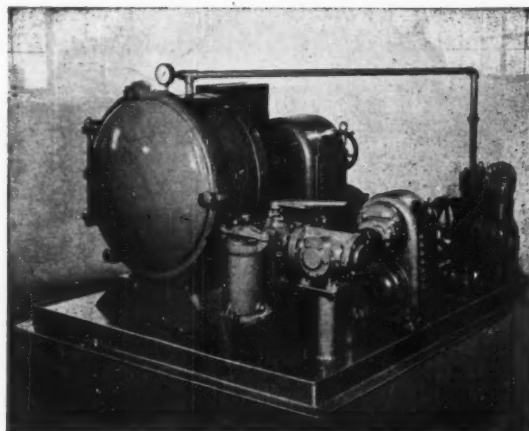
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The nation's leading grease manufacturers are processing with the Cornell Machine because of its exclusive micro-film method, which reduces even the heaviest greases to an extremely thin film moving over a rotating disc with great velocity and tremendous turbulence. The result is a supremely smooth, thoroughly worked product which is completely de-aerated. The processing is done at a rate up to 210 pounds per minute.

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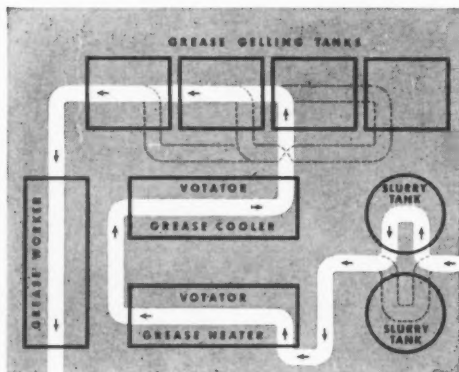
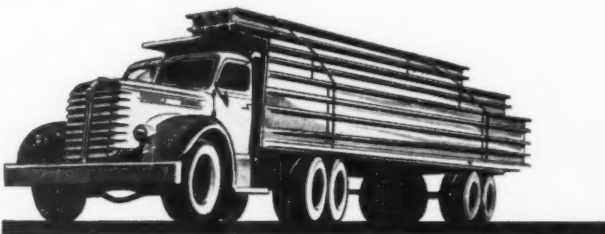


Grease Homogenizer, showing feed pumps, strainers and vacuum pump.

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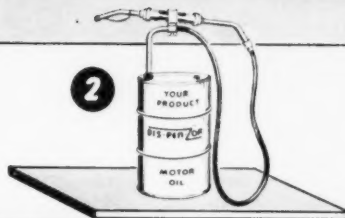
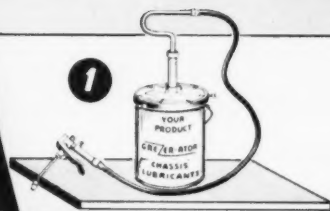
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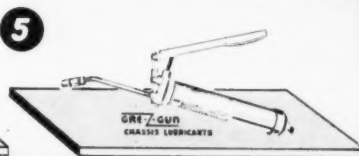
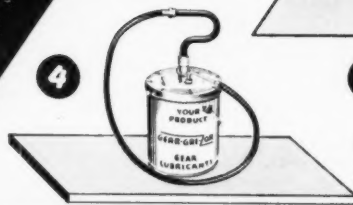
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Zee Line Promotional Lubrication Equipment

At left (top), TRANS-Z-FER PUMP; (bottom) GEAR-GRE-ZOR. In center, GRE-Z-GUN. At right (top) DIS-PEN-ZOR; (bottom) GRE-ZER-ATOR.

A wide line of lubricating equipment that increases petroleum products sales has been developed by National Sales, Inc., 812 North Main, Wichita, Kansas.

Sold exclusively to and by the oil industry, the five products in the Zee Line make proper lubrication an easier job on the farm, in the factory, for fleet operators, in garages, etc.

The concern has salesmen covering the United States, with east and west coast representatives. National Sales has a modern service department completely equipped for servicing and repairing any item in the line. In addition to the home office, other repair depots are located at San Francisco and New York City.

These units assure "refinery clean" lubricants when they are dispensed from the original container.

The Tran-Z-Fer Pump handles all types of fluids—chassis and gear lube, gasoline, alcohol, motor oil, kerosene, etc. The adjustable bung adapter fits any standard two-inch bung hole. It is equipped with eight feet of hose and a new type non-drop nozzle. The pump is designed for long, dependable service.

Gre-Zer-Ator is the first high-pressure grease gun that fits on the original container. Rust resistant, equipped with 10 feet of hose, this unit will develop over 5,000 pounds of pressure. With no air or electrical connections, the Gre-Zer-Ator is a one-man, one-hand lubricating unit.

Dis-Pen-Zor assures accurate measuring of oil from "drum to crankcase," delivers one quart of oil to two strokes. It fits all size drums with 1½" and 2" openings, and handles all SAE grades of motor oil used under seasonal operating temperature conditions.

Gear-Gre-Zor is sturdy, yet portable and lightweight. It keeps gear lube refinery clean, fits all standard 25 to 40-pound lug cover pails of 10 to 12-inch diameter. Recommended for use with SAE 80-90-140 gear

The INSTITUTE SPOKESMAN

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THE NATIONAL LUBRICATING GREASE INSTITUTE

HARRY F. BENNETTS, Editor

4638 Millcreek Parkway

Kansas City 2, Mo.

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lubricants, it is made of rust-proofed steel and cast aluminum and has five feet of hose.

Gre-Z-Gun develops high pressure needed for thorough lubrication on small grease jobs. Holding approximately 18 ounces, this dent and rust-resistant unit has an easy-grip barrel and a full-formed sturdy lever handle. It has a disappearing filler ram with bayonet lock for handier operation.

Lacey to Manage Technical Products Plant for Swift

F. E. Lacey, who has been head of the industrial oil department of Swift & Company since 1944, has been appointed manager of the Technical Products Plant of Swift located at Hammond, Indiana. The appointment was announced today by Mr. E. A. Moss, vice president of Swift.

Mr. Lacey joined Swift & Company in 1926, shortly after being graduated from the University of Missouri. In the 22 years since then he has been associated with the fat and oil business of the company.

After a period of student training at So. St. Joseph, Mo., Lacey was engaged in sales work in New York City and Toronto. He returned to the general offices of the company in Chicago in 1928 and for the next 16 years was associated with the procurement and sales of fat and oil for the company.

He was appointed manager of the industrial oil department in 1944.

Armour Offers Third Booklet Of Fatty Acid Series

"The Selection and Use of Fatty Acids"—Free to Spokesman Readers

Fatty acids and their compounds offer an almost unlimited range of chemical and physical properties from which to choose, which is the main reason for their wide-spread utility. Each individual fatty acid has certain definite properties—properties which differ from those of any other fatty acid. Mixtures of two or more of these pure acids likewise have distinctive characteristics which make some of them suitable, some unsuitable for any one specific use.

As a helpful guide to the selection and use of fatty acids, Armour and Company has produced a twenty-page booklet aptly titled, THE SELECTION AND USE OF FATTY ACIDS. This booklet outlines the major fields of usage for fatty acids and their derivatives, explaining for each the properties needed, functions performed, and types of acids commonly used.

The booklet attempts to cover in a general way the major applications for fatty acids and their derivatives and it has a fatty acid composition and constant chart as a part of its contents.

President's page

by B. G. Symon, President N.L.G.I.

WORTHLESS JUNK OR PRICELESS TREASURE



Whether you live in a large or small community, the story is about the same. In either case you have at least one shrine commanding the admiration and respect of your community, and possibly the nation. It may be a house, a park, statue, meeting room, or even a gavel or chair. Whatever it may be, you cherish and preserve it as a constant reminder of a great man, or group of men, who have unselfishly given of themselves for the benefit of others.

In and near the nation's capital we find the best examples of this universal respect for men who have lived and died in the service of others. Watch the hushed reverent crowds as they tour Mount Vernon. Heads uncovered, they stand before the Tomb of the Unknown Soldier. They don't laugh and chatter, just pause in silence, bound together by memories sprung from a common source but shaded by different interpretations.

We go on year after year, carefully preserving the tangible possessions surrounding great men. We preserve chairs, tables and ancient buildings as priceless treasures. Today we preserve the White House at a cost of four to five million dollars. The ideals represented in its tangible structure are too sacred for destruction.

Preserving homes and furniture of great Americans has become a national treasure hunt, but many of the American principles these men lived and died for have been cast aside as worthless junk and forgotten beneath a debris of new and fashionable "modern thinking." Why we have treasured our founding fathers' homes and chairs they sat in and at the same time forgotten the great truths of government and economics they taught us remains a twentieth century mystery.

Too many of us can glibly identify the pieces of period furniture that surrounded George Washington. Too few of us have the slightest idea of his thoughts on government and economics.

All of us are completely familiar with the Lincoln Memorial, his home at Springfield and the type of hat he wore. His beliefs on what constituted a healthy nation have been as completely lost as if they possessed less value than the hat itself.

Many of us are familiar with memorials to Benjamin Franklin, Alexander Hamilton, James Madison and others of that great body of men who drafted the Constitution. Few of us can discuss intelligently the basic principles which guided these men in preparing the Constitution—"that most wonderful work ever struck off at a given time by the brain and purpose of man." We have done a good job of marking the locations where they performed their historic tasks. But there is a greater need today of rediscovering and perpetuating the ideals of these men than of preserving the buildings with which they were associated.

On Memorial Day, besides honoring the men who fought and died defending the principles laid down by our founding fathers, let's take time out to review these principles. They constitute a priceless heritage, but they are in danger of being forgotten.



Kejell Pederson tying up the barbs of a 150-lb. steel harpoon. This steel point contains a time fuse and an explosive charge to kill the whale, while the barbs spring out to fasten themselves securely in the whale's body.

Floating Whale Factory

DELIVERS RECORD

Sperm Oil CATCH

**"Anglo-Norse," at Sea Ten Months
Chasing "World's Largest Game"
Unloads 9,300-Ton Cargo**

LAST WEEK hundreds of normally hard-to-impress New Yorkers hurried to the Bayway, New Jersey, docks of the Werner G. Smith Company, Division of Archer-Daniels-Midland Company to get a close look at one of the most unusual factories ever seen in New York Harbor. There, worn and battered after ten straight months at sea, the "Anglo-Norse," a 16,000-ton floating whaling factory ship, dropped anchor to discharge 9,300 tons of sperm oil, bought by the Werner G. Smith Division and (valued in the millions) because of its vital importance to modern industry.

A ship of British registry manned chiefly by Norwegians, the "Anglo-Norse" is the mother-ship of a flotilla of seven whale-killer boats, each about the size of a tug. This unique expedition is the only whaling operation in the world that is devoted exclusively to catching sperm whales.

After leaving Tonsberg, Norway, last May, the "Anglo-Norse" and killer boats steamed their slow way across the Atlantic, through the Panama Canal and down the coast of South America to the whaling grounds off the coast of Peru. There the swift maneuverable killer-boats ranged over the whaling waters, shooting exploding harpoons into the sides of 2,501 sperm whales, which were then towed back to the floating factory for rendering. At the factory ship the whales are winched up a special ramp in the stern of the factory ship and hauled up onto the "flensing" deck, where the blubber,

bone, and meat are cut into small pieces for rendering in the huge digestors and separators to extract the valuable sperm oil. This involves a tremendous amount of work for the crew—sawing, hacking, and chopping away at the 40 to 60 ton mammals with long-bladed, razor-sharp "flensing knives" and spades. This greasy work goes on without interruption until all whales are cut up—often lasting 10 to 11 hours at a stretch. Meanwhile, the "cooking" process goes on endlessly and the oil is stored in huge tanks aboard the factory ship. The Norwegians are particularly hardy seamen, accustomed to being at sea for long months at a time. They have an additional incentive in a profit sharing agreement which allows each man of the 160 man crew a share in the total catch. A good catch, such as this, will give each man approximately 10,000 Norwegian kroner—equal to over \$2,000 at the current rate of exchange, but worth double that in terms of purchasing power in their homeland.

Most of the sperm whales processed weighed between 40 and 60 tons each. From thirty to forty barrels of

sperm oil are obtained from an enormous cavity in the sperm whale's head, known as the "case." This natural reservoir apparently acts as a means of equalizing the tremendous pressures of the ocean as the sperm whales dive to great depths in search of giant squid and octopus that make up their regular diet. Sperm whales have formidable-looking teeth, six to ten inches long, and are the only species of whale with a throat opening wide enough to have swallowed Jonah.

The oil from sperm whales is inedible, and is actually a liquid wax that is solid at ordinary room temperatures.

The Anglo-Norse is owned by the Falkland Shipowners, Ltd., of London. Built in 1914, it has roamed the seas in search of whales until World War II, when it was assigned the more prosaic task of hauling routine cargo.

One of the principal uses of sperm oil as a lubricant is in its sulfurized form mixed with mineral oil and subsequently used as a cutting oil. Where other fatty oils are esters of fatty acids and glycerin, sperm oil is composed of 66% of higher fatty



A whale's-eye-view of the floating factory. The main winch is capable of hauling up a 90-ton whale. The "ribs" on the ramp keep the whales from sloshing about in rough weather as they are being hauled aboard.



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alcohol esters and only 33% of the tri-glycerides.

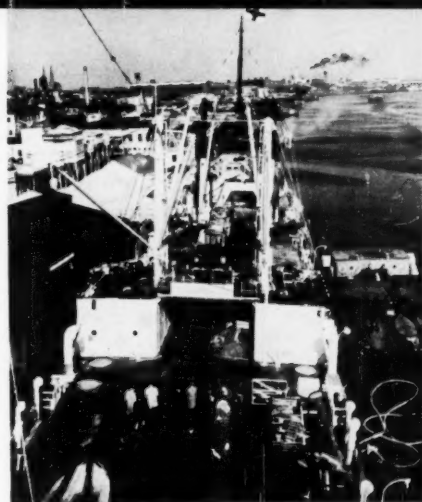
To a sperm oil usually having a cloud point of 45°F. is added 10-12% of sulfur under sufficient heat to complete the reaction. When other fatty oils are used as a base for sulfurizing oil there are usually more substitution products made than addition products. This is evidenced by the amount of hydrogen sulfide given off during the reaction.

In either air-blowing or steam-blowing the completed sulfurized product to make it as free corrosion as possible, there is usually a marked gain in the viscosity of these oils. This is not noticeable in the sulfurized sperm oil. Extensive tests have shown that when sulfurized sperm oil is used as a cutting oil, the life of the cutting tool is prolonged. Because of the low viscosity of the sulfurized sperm oil, it can be mixed with more varied types of mineral oil than any other sulfurized fatty oil. The sulfurized sperm oil is also less susceptible to oxidation than any other fatty oils.

A tremendous amount of sperm

oil is needed in the United States for industrial purposes. Sperm oil does not oxidize and become "gummy" or harden like other fatty oils. Sperm oil is unusual in that it thins out extremely slow under heat in relation to other fatty oils and hence provides long-lasting lubrication, making it a highly valuable ingredient in extreme pressure and high-speed lubricants. As mentioned above, sperm oil is a liquid wax. Spermaceti wax is the high melting point fraction that is removed from the oil. Spermaceti wax is used in candles and is important to cosmetics because its crystals provide a rich-looking, glossy sheen that makes cold cream highly appealing to women. Sperm oil is used in the fat liquoring stage of leather manufacture to give softness and flexibility to the skins. In textiles, sperm oil lubricates the fibres to prevent unraveling as they are being twisted into threads. Some of the higher alcohols in sperm oil find application in the chemical field in detergents and wetting agents.

After unloading its valuable cargo, the "Anglo-Norse" was dry-docked to have 35 tons of barnacles scraped



"The flensing deck" of the Anglo-Norse where the thick strips of blubber are stripped off the huge mammal and slid down chutes (along the sides of the decks) to the mincers and rendering boilers below decks.

off its bottom, before returning to Norway to fit-out again for another ten-month voyage.



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Top Quality

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LUBRICANTS



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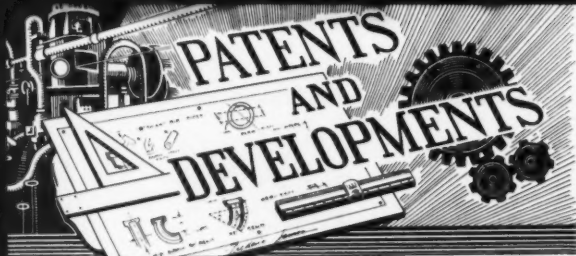


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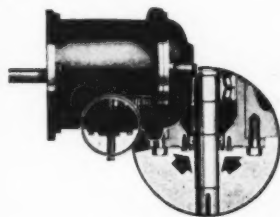
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**AUTOMOTIVE OILS
AND GREASES**

**INDUSTRIAL OILS
AND GREASES**



FROST REMOVING GREASE—A non-corrosive paste-like composition for preventing tenacious adhesion of frost to chilled surfaces is described in a Standard Oil Dev. Co. patent. It consists of 60-80 wt.% of white mineral oil, 12-18% of calcium chloride, and remainder being a water-insoluble calcium soap of higher fatty acids to provide a grease-like consistency. (U. S. 2,462,970.)



A G I T A T O R DRIVES—Nettco agitator drives made by New England Tank & Tower Co. are now "extra protected" against leakage by the John Crane Rotating Seal (Chem. Proc. Prev. 3/49 p.123) (See cut).

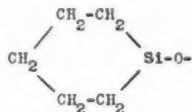
FOAM PREVENTER—Foaming in the concentration of surface-active materials can be prevented by adding an aqueous solution of n-butyl trichlorosilane, according to a duPont patent (U.S. 2,462,999).

GREASE PUMP ASSEMBLY—A grease pump assembly with a pressure generating pump for a reciprocating material pump was described in a patent issued to Lincoln Engrg. Co. (U. S. 2,463,113.)

ROSIN SOAP GREASE—A method for preparing rosin soap grease, covered in a patent issued to Standard Oil (Indiana) comprises heating a mixture of the oil and unpolymerized rosin at 350°-450° F. in presence of 1 wt.% of a catalyst (S. Se or Te), but in absence of a hydrogenation catalyst for a period of time to give the properties desired. (2,463,823.)

Another patent to the same firm on the same subject specifies heating at 450°-525° F. in presence of 20-50 wt.% of a sulfur-bearing hydrocarbon oil for 1-12 hrs., following by saponification. (U. S. 2,463,822.)

OIL PENTAMETHYLENE SILICONE POLYMERS—A method of producing an oily polymer having a structure:



where n is from 5-50 was described in a Continental Oil Co. patent. It includes hydrolyzing a cyclo-silicon halide in an ice bath to give a primary cyclo-silicone in which n is not over 5. This is recovered, dissolved in an inert solvent and condensed with an acid-acting condensing agent (U.S. 2,464,231).

DRUM PUMP FOR HANDLING GREASE—General Scientific Equipment Co. of Phila. announced availability of a new drum pump for handling heavy grease easily and quickly. A special spider design of the piston and intake opening is said to provide a cut-through action and large capacity so that heavy greases can be pumped at 3 gpm and higher. (JC 3/10 p. 4.)

MANUFACTURE OF LUBRICATING GREASE—Boner of Battenfeld Grease & Oil Corp. is writing a series of articles on grease manufacture which will include production, processing equipment, calcium and soda base greases, aluminum and barium base greases, and lithium base and miscellaneous greases. (Petr. Refiner 3/49 p. 109.)

EFFECT OF ADDITIVES ON PRESSURE STABILITY OF CALCIUM STEARATE-CETANE GELS—Measurements of total liquid expressed and rate of loss of liquid were made on gels of calcium stearate and cetane containing varying amounts of water, stearic acid or methanol, using a syneresis press operated by gas pressure, the work being done at the Univ. of Southern Calif. An optimum concentration of additive was found for maximum retention of cetane. With water this occurs at an equimolar ratio of soap to water, with stearic acid and methanol at relatively lower concentrations of additive. The calcium stearate in these systems was found to be more perfectly crystallized than in cetane systems without additives. The ability of these systems to retain oil does not seem to depend primarily on the crystal structure of the ultimate particles in the gel but rather on the nature and extent of secondary aggregation (ASC San Francisco 3/27/49 p.18F).



TILTING KETTLES—Modern stainless steel steam jacketed tilting kettles are being made by Groen Manufacturing Co. of Chicago (Chem. Proc. Prev. 3/49 p. 98) (See cut).

SOAP ANTIOXIDANT—A patent issued to Nat'l Oil Prods. Co. discloses a method for obtaining an antioxidant from soap by contacting the soap with ethylene dichloride in which the antioxidant dissolves (Can. 454,025).

ALUMINUM SOAP-HYDROCARBON SYSTEMS—In a study of aluminum soap-hydrocarbon systems at Stanford Univ., it was found that many additives have pronounced and manifold effects on the behavior of aluminum soaps in hydrocarbons. Some additives accelerate the formation of jellies while others retard it. Some thicken the gels while others liquefy them. One of the many mechanisms involved is that of metathesis between fatty acid radical of the soap and acidic additives. Such occurrence of metathesis was observed by the preparation in benzene of aluminum dibenzoate from the di-laurate (Smith et al, J. Amer. Oil Chem. Soc. 3/49 p.135).

OIL SOLUBLE GLYCOLS IN GREASES—A Shell Development Co. patent discloses a grease composition containing a gelling amount of soap and 1-10% of an oil soluble monomeric glycol having at least 6 carbon atoms (U.S. 2,465,961).

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MELTING POINT APPARATUS—

The new Vanderkamp "Melt Pointer" to be announced soon by Scientific Glass Apparatus Co., Inc., of Bloomfield, N. J., is a jacketed head containing a solid copper head heated by three vertical rod heaters and having a window for noting the melting of the material held in fine melting point tubes (See cut).

CABLE-PULLING GREASES—According to the National Association of Corrosion Engineers, plain, old fashioned axle grease still rates high as a pulling lubricant for cables. Some of the desirable characteristics named by Phelps and Kahn of Phila. Elect. Co. are (1) Good adhesion to lead sheath and resistance to flow at 10° to 165° F., (2) Self-healing in air and under water, (3) Good lubricity, (4) Insolubility in water and wetting metal in preference to water, (5) Good insulator for low voltages, (6) No gumming, hardening or cementing to duct walls, (7) Chemical inertness, (8) Chemical stability to soil waters in pH 2-12, (9) High enough flash point, (10) Good heat conductor, (11) Permanency of properties, and (12) Reasonable time and effort for application. (Elect. News and Engr. 2/15/49, p. 88.)

SODIUM PALMITATE IN ORGANIC LIQUIDS—X-ray diffraction studies have been made by Marsden of Stanford Research Inst. on various phase systems of sodium palmitate in organic liquids. The descendent phases consist of (1) Sodium palmitate in one of three gamma crystalline forms, (2) An unknown component which may be a lamellar liquid crystal, and (3) The free organic compound. (J. Amer. Oil Chem. Soc. 2/49, p. 57.)

OIL SOLUBLE PETROLEUM SULFONATES—Griffin Chem. Co. has patented a process for producing oil soluble petroleum sulfonates from petroleum oils by adding to the oil, before sulfonation, about 5-15% of an oil soluble petroleum sulfonate, then adding concentrated sulfuric acid to the oil. (U. S. 2,462,829.)

FLUOROLUBES—Hooker Electrochemical Co. is producing a series of polymerized perfluorovinyl chlorides ranging from heavy grease-like substances through thin oil materials. They are said to be very stable to heat and powerful oxidizing chemicals (J. Commerce 3/25/49 p.3A).

PATENTS AND APPLICATIONS

Brit. Pat.—616,341 (Girdler Corp.)—Manufacture of lubricating grease.

Brit. Appl.—2012-3/49 (Standard Oil Dev.)—Grease. 2659/49 (Azienda Nazionale Idrogenazione Combustibili, A.N.I.C.)—Fatty acid separation. 2875/49 Standard Oil Dev.)—Fatty acids.

33558/48 (Proctor & Gamble)—Triglyceride and liquid oil.

Brit. Pat.—615,117 (Anglo Saxon Petr.)—Lube oils and greases.

615,564 (SOD)—Lubricating greases.

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THE IMPORTANCE OF

Proper Lubricants

For Farm Machinery

By M. D. GJERDE

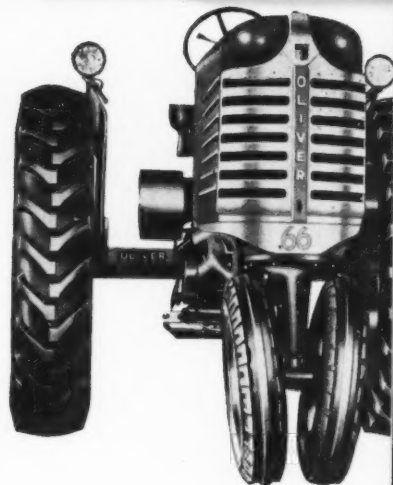
Standard Oil Company (Indiana)

WITH the extensive mechanization that has taken place on American farms, particularly since World War I, lubrication of farm machinery has become increasingly important. The lubricants required include those used in general automotive service—motor oils, gear lubricants, and greases. For some of these products, as well as others employed for more limited use, consideration must be given to special characteristics because of peculiarities sometimes encountered in farm service application.

In early farm equipment, lubrication was not of major concern. Bearing speeds in the horse-drawn equipment of bygone days were low, and frictional surfaces were not precision machined. Bearing design and materials were such that the general practice was to replace worn parts as necessary in these machines—which were used only a few hours or a few days a year, rather than to make any particular effort to minimize wear by more efficient lubrication than was afforded by oil can application of heavy machine oils or so-called "castor" machine oils. Some improvement was achieved through

the use of grease applied by means of screw cups. The products used were generally conventional cup greases of consistency equivalent to present N.L.G.I. Nos. 3 or 4, and were frequently referred to as "hard oils." With proper attention to application, lubrication with grease was superior to that obtained with oil because of better staying, sealing, and water resistance. However, it was no small job to fill the large number of grease cups sometimes involved and to keep them in working order. Plugging of grease channels was frequently encountered, particularly where long tubes were used.

In general, no particular merit can be claimed for the performance quality of the lubricants used in the older farm equipment, in which design left little opportunity to minimize parts replacement by preventive maintenance. However, special greases which were developed at that time for axle lubrication gave very satisfactory performance in spite of disabilities in the method of application. These products were "set" greases



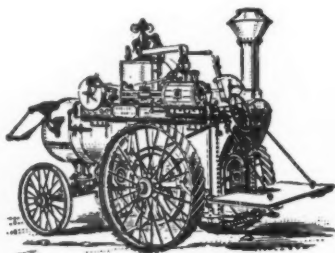
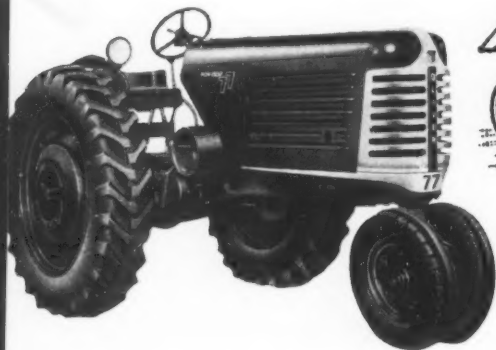
and generally contained fillers which improved their performance. Many such greases are still marketed.

Farm mechanization has progressed rapidly with the increased use of tractors but it should be recognized that a large number of passenger cars, trucks, and much miscellaneous equipment, all requiring proper lubrication, are operated on farms. At the first of this year some 4,928,000 cars and 2,191,000 trucks were in use on farms in this country, representing approximately 16 per cent and 33 per cent, respectively, of total registrations.

The discussion which follows is confined to the greases required for proper lubrication of modern farm machinery. The widespread use of greases for this service is due, primarily, to the improved method of applying them through suitable fittings by pressure gun application.

The lubrication needs of farm tractors and the machinery powered by them form the basis for the characteristics and the performance quality stated as desirable for the greases to possess. Passenger cars and trucks used on the farm are accommodated by greases of similar nature but may not need special characteristics desired to meet requirements peculiar to tractors and tractor-driven machines. Furthermore, farm cars and trucks in most cases receive complete lubrication at service stations in town rather than on the farm.

Farm tractor population in the United States reached some 3,114,000 the middle of this year, and there



A Nichols & Shepard steam traction engine was Grandpa's idea of farm mechanization. Compare it with the modern stream lined version on the same subject to the left. (Courtesy, "Implement and Tractor").

has been an accompanying increase in standard mounted and attached implements and machines powered by tractors, which include:

Tillage Equipment—plows, disc harrows, field cultivators

Planting Equipment—grain drills, planters, listers

Cultivating Equipment—cultivators, rotary hoes

Harvesting Equipment—combines, binders, threshers, pickers, headers

Hay Handling Equipment—mowers, rakes, loaders, balers, presses, choppers

Processing Equipment—hammer mills, roughage mills, shredders

Miscellaneous Equipment—manure spreaders and loaders, wagons, potato diggers, fertilizers.

In addition to the above, many types of special equipment such as post hole diggers, hay stackers, and manure loaders, are being employed to save labor through the use of tractor power.

The types of greases required for tractor lubrication are, in general, as follows:

Wheel Tractors—Chassis, Wheel Bearing, Water Pump.

Crawler Tractors—Chassis, Track Roller, Water Pump.

For implements and other equipment powered by tractors, lubrication is provided predominantly by pressure gun application of chassis grease. In a limited number of cases, screw cups are used for the application of conventional cup grease or for selective use of a particular grease not employed generally elsewhere on the unit. In a few implements, wheel bearing rather than chassis grease is used for wheel bearing lubrication, and in gear cases which are not sealed to permit the use of fluid gear lubricant, a soft fibre grease provides very satisfactory lubrication with little attention over long periods of operation. In some processing equipment, high temperature grease containing relatively light oil is required for high speed, anti-friction bearing lubrication. Small quantities of such grease are sometimes used in distributor and magneto, on breaker arm rubbing blocks.

The use of proper greases for the lubrication of farm machinery is essential for its efficient operation and maximum service life. Before discussing chassis and track roller greases, the following brief comments

are offered on several greases, the characteristics and performance quality requirements of which are the same for farm service as for general automotive lubrication:

Wheel Bearing Grease—smooth, short fibre, high melting point grease of medium consistency, generally soda soap grease containing relatively heavy mineral oil.

Water Pump Grease—heavy consistency, water resistant grease, generally of high calcium soap content and containing relatively light mineral oil.

Cup Grease—medium consistency, water resistant grease, generally made from calcium soap and containing light to medium bodied mineral oil.

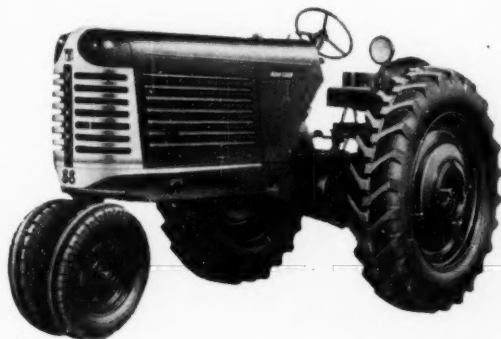
Fibre Grease—soft consistency, long fibre structure, high melting point sodium soap grease containing medium bodied mineral oil.

There are several reasons why special attention must be given to the chassis and track roller greases. Farm machinery is operated out of doors and must be lubricated over a wide range of seasonal temperatures. Under these conditions, proper dispensing quality of the grease is paramount. While some equipment, such as tractor plows, may have only two

points of lubrication and not require frequent application, others have a great number of points and need application at very frequent intervals. As an example, there are as many as 60 to 75 points of application on some combines. Most of these require application twice daily and some as often as four times during a day's operation. Corn pickers have even a greater number of points of application that require similarly frequent attention. Fewer points of application are involved in track roller lubrication but larger volumes of grease must be applied at relatively frequent intervals through low pressure dispensing equipment. In addition to dispensing characteristics, other qualities of chassis and track roller greases are of concern.

Chassis Greases vary considerably both in consistency and in structure. They are commonly calcium, aluminum, sodium or mixed base soap products containing relatively heavy mineral oils, with soap content and oil viscosity balanced to provide suitable dispensing quality. Resistance to the washing action of water is of great importance for automotive service in general, and while not of such great concern in farm machinery lubrication, it is a desirable quality for this service also.

In addition to functioning as a lubricant, chassis grease acts as a bearing seal to prevent entrance of con-



A present day tractor built for efficiency and economy. Its predecessor on the right is a Nichols & Shepard steam traction engine of a late 1800 vintage. (Courtesy, "Implement and Tractor").



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taminants—a major problem under conditions of operation on the farm.

The use of chassis greases containing heavy oil is desirable for warm weather service, and in sodium soap products high viscosity oil also offers some compensation for the disability of this type of grease with respect to water resistance. Many users also favor the use of stringy type chassis greases because of their tackiness and resultant staying quality.

For satisfactory dispensing at lower atmospheric temperatures, lighter oil greases must be used. In many instances stringy type products are found objectionable even though they contain light oil. Although such greases can be dispensed from the gun satisfactorily, excessive stringiness frequently develops at low temperature and causes considerable difficulty in filling the gun and in stringing from fittings after application.

In view of the conditions of use, it is most desirable to use two seasonal grades of chassis grease for farm machinery—a heavy oil product, of stringy type if preferred by the user, for warm weather, and a lighter oil product of smooth structure for lower temperature service.

Track Roller Greases are generally quite similar to stringy type chassis grease, although of softer consistency. In some units of early design the tough structure required in the grease for proper retention was obtained by the incorporation of relatively large amounts of filler, frequently asbestos. Recent designs of grease lubricated track rollers do not require such products and stringy grease of good oxidation stability, containing relatively heavy oil and of sufficiently soft consistency to dispense satisfactorily from volume type low pressure grease guns, gives very satisfactory service.

Generally two consistency grades meet requirements for seasonal use, the heavier summer grade having a consistency similar to that of a winter grade automotive chassis lubricant. In extremely hot weather the use of a heavier grade, such as the stringy type chassis lubricant employed for

general chassis lubrication, is desirable.

In discussing characteristics and performance quality requirements of greases for farm machinery, no comment has been offered on meeting the various services with all-purpose or multi-purpose greases. Where such products do not impose objectionable compromise in qualities required for any of the services in which they are employed, they should be satisfactory even though their appearance and some of their characteristics differ from those described as typical of specialized individual greases.

While improvements are continually being made in the quality of greases, those now available are very satisfactory for farm machinery lubrication. Unsatisfactory lubrication is usually due to lack of application because of neglect in servicing at proper intervals, use of the wrong type of grease, or contamination of the grease in storage and handling.

It can be expected that manufacturers of farm machinery will continue their efforts to effect more satisfactory lubrication of their equipment. Undoubtedly a great deal will be accomplished by improved design which will result in more convenient and fewer points of application. Such developments should even apply to machines which are operated only a few hours a year, some of which have heretofore been given little attention from the standpoint of lubrication.

In addition to improvements in design, joint educational effort by equipment manufacturers and lubricant suppliers will encourage the farmer to achieve the best possible lubrication of his farm machinery.

National Tran-Z-Fer Pump

Among the most promising new lubricating equipment products is the Tran-Z-Fer Pump, an all purpose transfer pump now ready for exclusive sales from coast to coast to refiners and compounders of the oil industry.

Youngest member of the Zee lubricating equipment line, marketed by National Sales, Inc., 812 North Main, Wichita, Kans., the Tran-Z-Fer Pump is designed to promote oil and grease sales.

Extremely versatile, the Tran-Z-Fer Pump handles chassis lube, diesel fuel, gasoline, alcohol, gear lube,

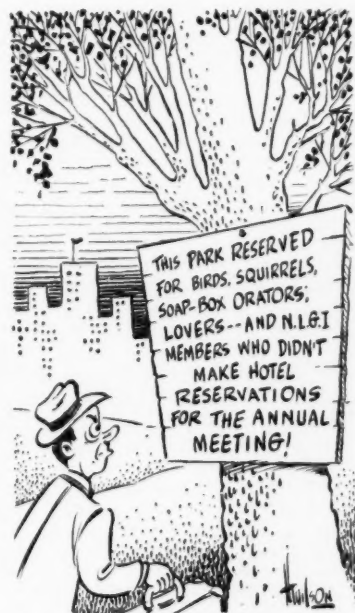
motor oil, kerosene and other fluids. It is ideal for transferring these fluids and is an excellent unit for filling Caterpillar tractors, conventional tractors and other equipment. The Tran-Z-Fer Pump is equipped with a steel spout, bail hook and bung ho'e adapter.

In announcing the Tran-Z-Fer Pump, Oliver Elliott, National Sales vice-president and general manager, said that the new item fits into the concern's program of bringing super service station performance to the farmer. It joins such items as the Gre-Zer-Ater, a one-hand grease gun, and the Gear-Gre-Zor, a convenient, portable gear lube pump.

By making proper lubricating service available on the farm, these products greatly increase demand for oils and greases, Elliott pointed out.

Designed for hard, all-weather duty, the Tran-Z-Fer Pump has one-piece pistons and simple, positive foot valves that insure longer wear.

The Tran-Z-Fer Pump delivers approximately 12 ounces of SAE 140 gear lube per stroke cycle, and fluids of different viscosity are dispensed at rates in direct proportion.



ANNUAL MEETING - OCT. 3 TO OCT. 5 - ROOSEVELT HOTEL, NEW ORLEANS

PROFITS *from a*

Non-Profit Research Institute

AN ASSET of unexplored possibilities for industrial and business firms in all fields is to be found in a not-too-old scientific industrial research organization in Kansas City, Missouri. It will not be found listed on any balance sheet, yet its facilities are immediately available to any individual, business, industry, foundation, or government agency.

Scientific industrial research is a tool which has wide application. Each business, each enterprise, each idea, is potentially the greatest in its field. Whether each is developed into its full possibilities depends to a large degree on how well and how constantly advantage is taken of every opportunity which will bring it into the lead position in its field and keep it there.

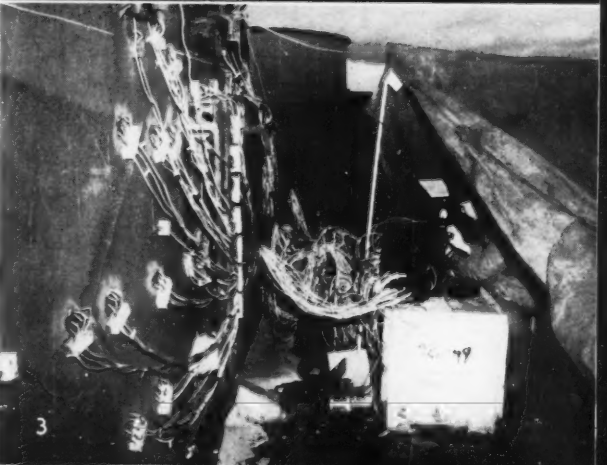
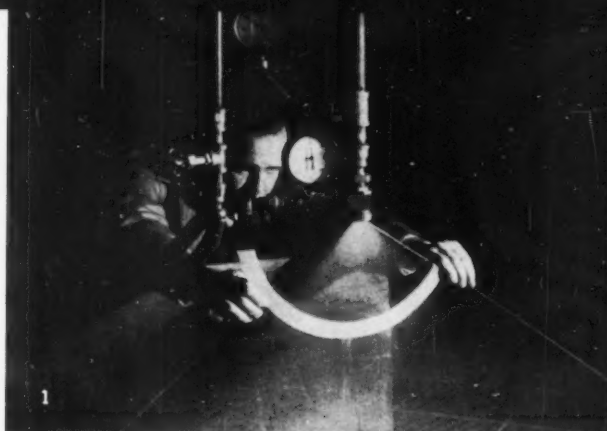
The mounting numbers of persons engaged in research of all kinds is indicative of the fact that one of the answers to the economic growth and prosperity, health, and security of our nation lies in continuing programs of research. Dr. Gerald Wendt, editorial director of "Science Illustrated," stated in a talk to the trustees of the Midwest Research Institute at their annual meeting in Kansas City in December, 1948.

What is meant by scientific industrial research and how can it accomplish these results? First, scientific industrial research is the application and adaptation by trained specialists of scientific knowledge and experience to the solution of problems in the fields of materials, processes, and equipment. Properly planned and executed, it can open the road to more economical, more profitable, and more varied production. The continuing use of research—constant exploration of the avenues of progress—is every manufacturer's best insurance of his market, his product, the future of the men and women of his community. Research can and does find new materials, new ways to use those materials, new ways to process them. It is a necessary part in the American philosophy of more and better things for all segments of our population.

Photo 1—Measuring spray angle magnitude of nozzle for use in fire fighting systems.

Photo 2—An electron microscope with its high magnifications and resolving power is extremely effective in the study by replica methods of surfaces of metals or of organic or inorganic materials and particularly in determining particle size and shape of any very finely divided material.

Photo 3—Stress readings at more than forty points can be read at one time with the strain gauge equipment being used to study a structural problem which arose on storage tanks.



Five years ago, industrial and educational leaders in the six-state area surrounding Kansas City, conceived the idea of harnessing this economic tool by creating an organization to provide for Mid-America the scientific and industrial research equipment which would, in general, help to insure the continued economic health of that area—stimulate industrial growth, encourage business expansion, utilize natural resources more completely, and at the same time provide greater employment possibilities for graduate students trained in the area. They established the Midwest Research Institute to serve the "Heart-of-America," but it has reached far beyond those boundaries in the service it has rendered to large and small industries, agricultural and mining interests, public health, and national defense.

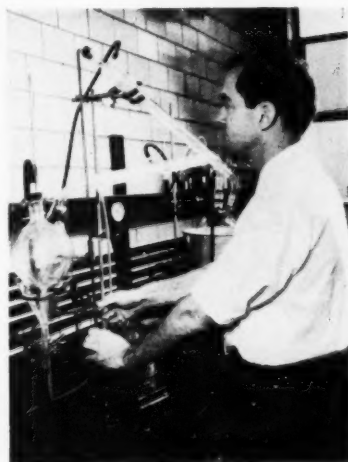
The Institute was founded as a non-profit, civic enterprise; the funds with which it began operations were contributed by far-sighted leaders with interests in the area of which Kansas City is the focal point; much of the equipment has been purchased from tax-free contributions. Personnel with records of exceptional experience in their specialized fields and many with recent work for and with the government during the war years were assembled to serve industry and commerce. The whole provides techniques and facilities which make it possible for any company or individual to benefit from research and development programs.

In today's economy, the consumer, whether it be of services, products, or ideas, is more particular as to the quality of his purchase. The purchaser of research has the opportunity of buying the services of one or several phases of research, depending on the objectives to be attained. This is particularly true at Midwest Research Institute where an integrated plan of staff and equipment is in operation. Here a company will find an unusual complement of specialized equipment that the average business firm does not want or need to include in their capital structure and personnel with skills and training for the study of exceptional or one-time problems.

At the Institute the first approach to each problem is in the capacity of a consultant. It often happens that a chemistry problem may be approached best through the use of electronics, or that the application of physics and engineering mechanics

can produce the answer to an agricultural problem. No definite plan is determined until all possible phases of a proposed project have been analyzed to insure that the most profitable course is followed.

The problems of a potential sponsor are discussed frankly and confidentially. If such a discussion indicates that a promising research program—whether of long or short duration—can be planned, the objectives of the project are decided and discussed with a group of experienced researchers. These early discussion stages might well be compared to the



A continuous concentrator constructed from ordinary laboratory glassware for use in a study involving flash evaporation.

plans and specifications which an architect prepares for a client who contemplates the construction of a house or building.

Equal frankness is observed if, in the opinion of the senior staff members, results cannot be accomplished commensurate with the costs which would be incurred. The vital point for progressive business men is that organizations such as the Midwest Research Institute have the personnel, the equipment, the experienced direction with which to analyze whatever problem may be presented to them wherein scientific, industrial research may be profitably applied.

A few typical questions will point out practical ways in which an organization such as the Midwest Research Institute can become, for a time, a functioning branch of any business firm, and the examples are

the answers which that group has found to problems submitted to them.

Does the success or popularity of a product depend on constantly finding newer and better materials from which to manufacture it? One sponsor has had a project at the Institute for four years which has to do with improved means for attenuating and processing glass fibers. Considerable effort has been expended investigating methods of collecting and treating glass fibers so as to improve their performance characteristics. Efforts are now being devoted, successfully, to product development.

Is competition in a particular field such that new or improved ways of processing must be constantly studied? Take, for example, the publication field in which the factors of low costs and competition are a more urgent manufacturing problem than in most fields. A series of machines were specially adapted to meet the particular problems of a large publishing house so as to improve the efficiency of their printing and binding operations.

Are there waste or by-products which can be turned from liabilities into assets? Studies along these lines have included developing new foods from dairy by-products and finding new uses for certain by-products of the animal industry.

Can new uses be found for farm crops? A three-way project by a national firm, state college experimental stations, and the Midwest Research Institute developed drought resistant grain sorghum into a new cash crop for the farmer. New production facilities, larger payrolls, and increased sales are following in the wake of such programs.

Studies and analytical work of researchers are not always confined to laboratory examinations. Frequently, work needs to be done in the field on prototype equipment in order to acquire the data necessary to the solution of a problem. An example of this is pictured in the illustration which shows the numerous strain gauges attached to a storage tank at a plant site. The conditions here are in strong contrast to those to be found in a laboratory equipped for strain gauge testing. Such studies "on location" are particularly important when it is difficult or impossible to simulate given condition in a laboratory.

These but scratch the surface of the questions which could be asked by each business—large or small,

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rural or urban. Sponsors of industrial research range from a national trade association of the laundry industry to public utility companies interested in the natural resources in the areas they serve as a source of new industries which will bring with them an increase in the consumption of electric power; from a member of the medical profession to a study in co-operation with the National Cancer Institute to develop and screen organic compounds to be used as anti-tumor agents; from the U. S. War Department concerned with national defense programs to a company interested in the design of spray nozzles for use in automatic sprinkler systems for fire protection.

Located in an area where agriculture and its products are still a major industry, the Midwest Research Institute has an intensive interest in problems of the farmer and the processor of farm and related products. In addition to those mentioned earlier, studies have been conducted on insecticides, germicides, fungicides. An Institute-developed method of hard surfacing for feed lots which has been under practical study at an experimental farm for several years is now in the final testing stage. Farmers throughout the area are looking forward to a method, inexpensive and easy of application, which will eliminate the quagmire conditions resulting from thawing of frozen feed lots and heavy seasonal rains.

Problems can be handled from the idea stage to a pilot plant installation. Once the problem is determined, the scientists study it in miniature, so to speak, in the laboratory. When the answer involves a new process or treatment, scale model and then full sized equipment is operated until satisfactory production is reached. When a process is developed to the pilot plant stage, members of the research staff may spend several weeks setting up a pilot plant at the sponsor's plant for full scale operation under manufacturing conditions.

Despite an extensive variety of laboratory equipment for work in electronics, metallurgy, engineering mechanics, optics, and all phases of physics and chemistry, equipment of new design is often required as a project progresses or to attain its objectives. A skilled staff of carpenters and machinists can construct such equipment quickly and economically in the well equipped shops of Midwest Research Institute.

The men who founded the Institute and serve on its advisory board of trustees, the directors who have guided its progress, the scientists who direct the research, the technical and professional staff who produce the detailed results, the business personnel—all have one firm conviction in common with those of other similar organizations, namely, that such institutes and foundations provide an unexcelled opportunity to the forward-looking leaders, that they are intangible assets to every industrialist, farmer, educator, professional person, which will return large dividends in widened business horizons, increased employment. These in turn will be translated into greater purchasing power, larger bank deposits, and those other tangible assets which are indicative of a successful business and a healthy economic area.

The doors of the Midwest Research Institute stand open to the people throughout the midwest and to the country as a whole. The business leaders who are insuring their place as the pioneers of the future are those who are taking advantage of that open door to let the discerning ray of scientific industrial research be focused on their problems and their potentialities.



OCTOBER 3-5
IN NEW ORLEANS

**AUTOMOTIVE
LUBRICANTS
GREASES AND
CUTTING
FLUIDS**



PENOLA INC.

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By Vice-Chairman H. L. Hemmingway, Manager, Technical Service Department,
The Pure Oil Company

During the month of March, there was considerable activity in your Technical Committee and its Subcommittees.

Mr. H. C. Zweifel, Richfield Oil Corporation, has written his Subcommittee on Planning, outlining its responsibilities and asking acceptance from the proposed membership. This subcommittee will deal with the accumulation, investigation, and dissemination of information on fundamental engineering problems and procedures which are peculiar to the manufacture of lubricating greases.

Mr. H. M. Fraser, International Lubricant Corporation, is Chairman of the Subcommittee on Procurement of Technical Papers for Publication in the Institute Spokesman. Ten invitations have been sent out asking for additional papers, and so far two have accepted. Acceptances have been received from sixteen of the proposed committee members.

Mr. Gus Kaufman, The Texas Company, who is chairman of the Editorial Subcommittee reports that his committee of four has not had any papers from Mr. Fraser's group as yet, but they have reviewed and approved for publication, the first installment of the new column—"New Developments".

The joint ABEC-NLGI Cooperative Committee on Grease Test Methods met on March 24, 1949 at the headquarters of the Anti-Friction Bearing Manufacturers Association in New York. This was the first meeting of this group in two years; five ABEC members were present and eight NLGI members plus Harry Bennetts who served as Secretary. Mr. C. E. Morse, Marlin Rockwell Corporation, who is Co-chairman of this committee with Ted Roehner, served as Meeting Chairman. Mr. Morse emphasized, in his remarks

to the Committee, the excellent progress made by this group and the high level of cooperation which has existed, since the formation of this group, between the two industries. Because of this, Mr. Morse suggested, and the Committee agreed, that meetings should be held each year.

Among the items discussed at the Meeting were the status of the ABEC Grease Guide, status of High Temperature-High Speed Test Machines, status of Low Temperature Torque Test, the requirement for a grease test involving oxidation and lubrication under dynamic conditions, the usefulness of the NLGI classification System to the Anti-Friction Bearing Manufacturers, and the Effect of Lubricants on Noise in Anti-Friction Bearings.

Also discussed were the results of long time storage tests on Greases G-6, G-7 and an uninhibited mixed base grease on which Norma-Hoffman Bomb oxidation results were obtained in 1944-'45 by a number of cooperating laboratories as part of the work of a Committee under Mr. H. L. Moir which was studying the Norma-Hoffman Oxidation test. The Texas Company has also conducted shelf storage tests on the same greases in anti-friction bearings. These storage tests will be continued to complete a five year storage period; to date, the grease which showed the poorest original Norma-Hoffman test was reported to be the only one of the three greases that has exhibited oxidation troubles in the bearings on shelf storage. More complete results on this test, and more information on the other subjects will be included in a later issue of the Spokesman when the minutes of this meeting are completed.

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Swift & Company Joins N.L.G.I.

Recently welcomed to membership is Swift and Company, who has appointed Mr. F. H. Beneker as their N.L.G.I. representative. J. E. Farbak has been named as Technical Committee representative. A distinguished and interesting history surrounds our new member.

The industrial oil processing unit of Swift & Company's technical products plant is located at Hammond, Indiana. This city was named after a meat packer, Mr. G. H. Hammond, and has long been identified as one of the great industrial areas of the United States.

The new plant is located on a 70-acre tract which is being set aside by the company for further development of technical products facilities. At present, the plant includes units to carry out three processes, namely solvent crystallization, solvent fractionation, and fat splitting. These processes are operated integrally for the first time.

Mr. Hammond and G. F. Swift, founder of Swift & Company, led almost parallel industrial lives in the early days of their business activity. It was Hammond who designed the first practical car for shipping refrigerated meat from producing areas of the West to the consuming areas of the East. In 1912 Swift & Company acquired the G. H. Hammond company and still operates it under that name.

Swift started in business for himself in 1855 on Cape Cod. His total capital was \$20 which he had borrowed from his father. It wasn't long before young Swift had bought a wagon to use in selling his meat among his neighbors on Cape Cod. Gradually he expanded and established several markets. From then on his advance was rapid. In 1875 he moved to Chicago where he became a cattle buyer, and in 1885 Swift & Company was incorporated as a meat packing company with Swift as the president.

Seven of Mr. Swift's sons followed their father in the meat packing business. They carried on a strict policy of abhorrence of waste which is still adhered to. In fact, the Hammond Industrial Oil plant is not a venture into a new field. Rather it is further

utilization and further refinement of materials produced in meat packing plants, plus others that are bought on the outside.

The basic reason for having the plant is to upgrade the quality of various animal, vegetable and mineral fats and oils. The finished products range from large volumes of lubricating compounds or oils, to ingredients for enriching the vitamin content of margarine.

Construction of the Hammond plant began in August, 1947, and the first unit was put in operation December, 1948. Research facilities have been provided as a part of the



F. H. BENEKER

plant to seek new processes and more products. A force of 78 operating employees, nine chemists and eleven chemical engineers and other technicians is required.

F. H. Beneker, sales manager for the industrial oil department of Swift & Company, has been associated with the company in various by-product sales capacities since 1923.

Mr. Beneker joined Swift & Company in Cleveland in the sales division and two years later was transferred to by-product sales, serving in Cleveland and many other cities. In

1931 he was transferred to New York and remained there until 1943 when he was transferred to Chicago as assistant head of the tallow department.

In 1946 Mr. Beneker became associated with the industrial oil department and has served there during construction of the company's new technical products plant at Hammond, Indiana.

Mr. Beneker was born in St. Louis, Missouri, and was graduated from high school at Lakewood, Ohio. He also attended Ohio State University.

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Books and Publications

... ABOUT THE INDUSTRY

All books reviewed on this page may be obtained from the office of the National Lubricating Grease Institute, 4638 Mill Creek Parkway, Kansas City 2, Missouri.

Physical Constants of Hydrocarbons

by Gustav Egloff, Director of Research, Universal Oil Products Company, Chicago

Volume I—Paraffins, Olefins, Acetylenes, and Other Aliphatic Hydrocarbons, 1939, 6x9, 403 Pages, \$7.50

Volume II—Cyclanes, Cyclenes, Cyclynes, and Other Alicyclic Hydrocarbons, 1940, 6x9, 605 pages, \$9.00

Volume III—Mononuclear Aromatic

Hydrocarbons, 1946, 6x9, 672 Pages, \$12.00

Volume IV—Polynuclear Aromatic Hydrocarbons, 1947, 6x9, 540 double-column pages, \$13.50

The scope of this work is such that it may be utilized in pure and applied science and in industries such as petroleum, natural and manufactured gas, chemical, rubber, plastic, resin and pharmaceutical. The idea underlying this four-volume study of the Physical Constants of Hydrocarbons has been to contribute to the fundamental knowledge of hydrocarbons from the scientific as well as the pragmatic point of view. In the present work, the critical study of the hydrocarbon constants and their interrelationships to derive useful and sound generalizations has been the desired goal. The melting point, boiling point, specific gravity, and

refractive index of all classes of pure hydrocarbons will appear in four volumes and their interrelationships in the fifth volume. The work is restricted to these four constants chiefly because they are the ones most frequently employed in identifying hydrocarbons and in industrial engineering. Bibliographical sources of all experimental values are given.

Silicones and other Organic Silicon Compounds

by Howard W. Post, Professor of Chemistry, University of Buffalo
1949, 225 Pages, 6x9, \$5.00

The purpose of this new book is to organize, correlate and evaluate the great mass of material now in the chemical literature relating to silicone resins and other aspects of the organic chemistry of silicon.

The remarkable physical properties of organic silicon materials, some of which are popularly known as silicone resins, have aroused the keen interest of chemists, metallurgists and engineers in many branches of industrial technology—especially in the fields of plastics, paints, insulation, textiles and metals.

In this book, you will find complete and critically evaluated information on the chemistry and applications of organic silicon compounds, including a survey of the patent literature and bibliography up to early 1948. It is organized on the premise that the history of the subject can be divided into two eras—the so-called era of Kipping, in honor of the greatest single producer in this field, and the so-called industrial era during which the torch definitely passed to the industrial chemists of the United States. Development during this second era has been so rapid that the discussions are logically divided to cover separately the academic contributions and the patents. High-temperature work, both academic and otherwise, has been grouped into one chapter. Separate consideration is given to practical uses, nomenclature and to the listing of physical data.

Vegetable Fats and Oils

by George S. Jamieson, Ph.D.,
Chemist in Charge of Oil, Fat and Wax Laboratory, Bureau of Chemistry, United States Department of Agriculture

Second Edition, 508 Pages, \$8.00
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mation about these critically important materials, the revised edition of this monograph has been thoroughly rewritten and brought up to date. One of its many valuable features is the inclusion of descriptive data resulting from the author's recent trip to South America as a member of a commission to investigate agricultural products there.

The book contains selected data and other facts on the sources of these products, their characteristics, composition, properties and uses. Commercial and laboratory processes for the preparation and extraction of fats and oils from oleaginous seeds, clarification, bleaching, deodorization, hydrogenation, refining and other treatments in special cases are discussed. Attention has been paid to grades and specifications covering both crude and refined oils.

Methods are given in detail for the sampling and examination of seeds, oils, fats, press cake and meals as well as tests for evaluation purposes and for the detection of adulterants. All this information is exhaustively documented.

This book is designed not only to serve chemists, manufacturers and technologists, but also agriculturists, biologists, students, teachers and many others interested in the chemistry, examination, production, treatment and utilization of the vegetable fats and oils for edible, medicinal and technical purposes.

The Alkaline Earth and Heavy Metal Soaps

By Stanley B. Elliott, Ass't to the President, The Ferro Chemical Corp. Subsidiary of Ferro Enamel Corp., Cleveland, Ohio

340 Pages, Illustrated, \$7.50

The purpose of this capably written and thorough-going treatise on metallic soaps is to acquaint research chemists and technologists in the petroleum, paint, and lubricant industries with the properties, formulation, methods of manufacture and utility of these industrially important materials. Fatty acids, naphthenic acids, drying oils, and resins are discussed both individually and in chemical combination with eight different groups of metals. The uses of these soaps have been divided into three classes, based respectively on the cation, on the ability to influence the characteristics of liquids, and on

the physical properties of the individual soap. Knowledge of details of the manufacturing processes is of great value in determining the cause of variations between soaps which are apparently identical. In addition to the main treatment of the subject, six appendices on patents, specifications and applications are included; these greatly increase the practical value of the book to plant supervisors, experimental and control chemists, and development engineers.

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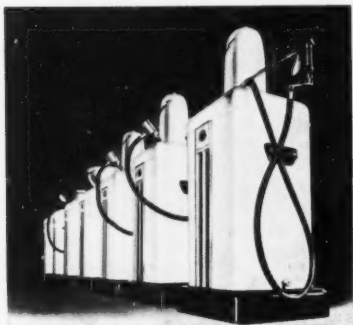
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